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Indian Standard

CONVENTIONAL SIGNS FOR THE INSTALLATIONS OF SHIPS' VENTILATION AND PIPELINE SYSTEMS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 10·00 Gr 6

July 1981

Indian Standard

CONVENTIONAL SIGNS FOR THE INSTALLATIONS OF SHIPS' VENTILATION AND PIPELINE SYSTEMS

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(*Continued on page* 2)

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Indian Standard

CONVENTIONAL SIGNS FOR THE INSTALLATIONS OF SHIPS' VENTILATION AND PIPELINE SYSTEMS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 February 1981, after the draft finalized by the Shipbuilding Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 Conventional signs and symbols are widely used in schematic diagrams to indicate various items of ventilation and pipeline systems and their relationship to one another. It is now felt necessary to have a standard system of signs to represent various parts of ships' ventilation and pipeline systems.

0.3 In the preparation of this standard, assistance has been derived from ISO/DIS 538 'Conventional signs to be used in schemes for the installation of ventilation and pipeline systems', issued by the International Organization for Standardization (ISO).

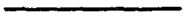
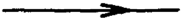
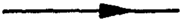
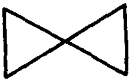
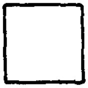
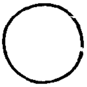
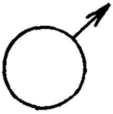
1. SCOPE

1.1 This standard specifies the conventional signs to be used in schemes for installations of ventilation and pipeline systems in ships.

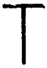
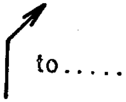
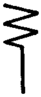
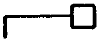
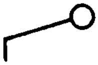
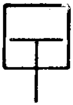
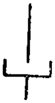
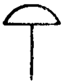
1.1.1 Conventional signs and symbols, not mentioned in this standard, may be derived from the general conventional signs given in **2** by adding an elucidation to the legend of the drawing.

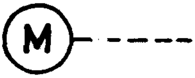
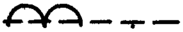
2. SYMBOLS

2.1 General Conventional Signs (Piping and Ventilation System)

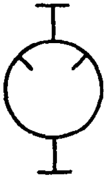
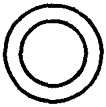
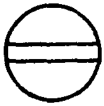
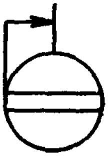
No.	Description	Symbol
2.1.1	Pipe/duct	
2.1.2	Pipe/duct with indication of direction of flow	 or 
2.1.3	Valve (type of valve to be indicated in the drawing)	
2.1.4	Appliances and fittings (the square to have marking abbreviations indicating the fittings concerned), excluding valve	
2.1.5	Indicating and measuring instruments (direct reading)	
2.1.6	Indicating and measuring instruments (remote reading)	

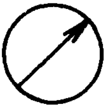
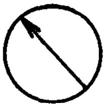
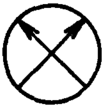
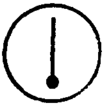
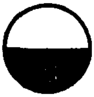
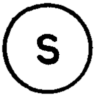
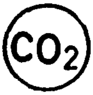
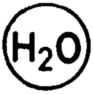
2.2 Control and Regulation Parts (Piping System)

No.	DESCRIPTION	SYMBOL
2.2.1	Hand-operated	
2.2.2	Remote control	
2.2.3	Spring	
2.2.4	Weight	
2.2.5	Float	
2.2.6	Piston	
2.2.7	Thermostat	
2.2.8	Membrane	

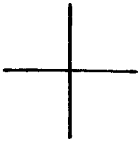
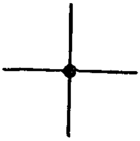
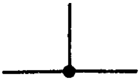
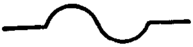
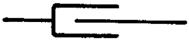
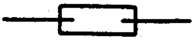
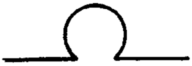
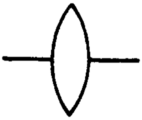
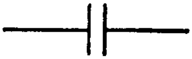
No.	Description	Symbol
2.2.9	Electric motor	
2.2.10	Electro-magnetic	

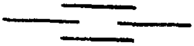
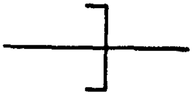
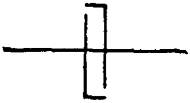
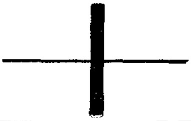
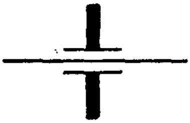
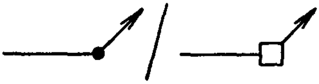
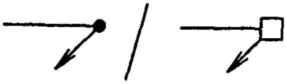
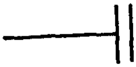
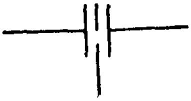
2.3 Indicating and Measuring Instruments

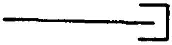
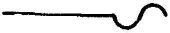
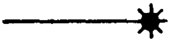
2.3.1	Sight flow indicator	
2.3.2	Observation glass	
2.3.3	Counter (indicate function)	
2.3.4	Recorder	

No.	Description	Symbol
2.3.5	Pressure gauge	
2.3.6	Vacuum gauge	
2.3.7	Compound gauge	
2.3.8	Thermometer	
2.3.9	Level indicator	
2.3.10	Salinometer	
2.3.11	Gas analyser (indicate function)	
2.3.12	Hygrometer	

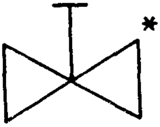
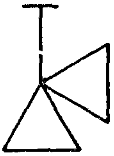
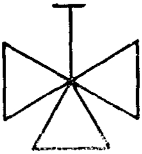
2.4 Pipe/Duct and Joints

No.	DESCRIPTION	SYMBOL
2.4.1	Crossing pipe/duct, not connected	
2.4.2	Crossing pipes connected	
2.4.3	Tee pipe/duct	
2.4.4	Flexible pipe/duct	
2.4.5	Expansion joint with gland	
2.4.6	Expansion joint sliding	
2.4.7	Expansion pipe	
2.4.8	Corrugated expansion pipe	
2.4.9	Joint, flanged	

No.	Description	Symbol
2.4.10	Joint sleeve	
2.4.11	Joint screwed	
2.4.12	Joint quick releasing	
2.4.13	Bulkhead crossing, watertight	
2.4.14	Bulkhead crossing, non-watertight	
2.4.15	Pipe/duct, going upwards	
2.4.16	Pipe/duct, going downwards	
2.4.17	Blank flange	
2.4.18	Spectacle flange (piping system)	

No.	DESCRIPTION	SYMBOL
2.4.19	Closing device, screw cap/plug/nut	
2.4.20	Tail (end piece) for hose connection	
2.4.21	Pipe with shower/spray	

2.5 Valves, Gate Valves, Cocks, Flaps and Fittings

2.5.1	Globe, valve, straight through (hand operated)	 *
2.5.2	Globe valve, angle (hand operated)	 *
2.5.3	Globe valve, three way (hand operated)	 *

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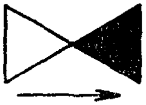
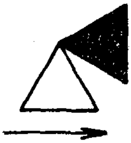
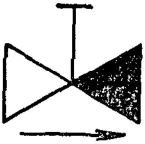
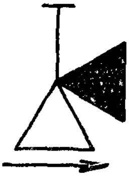
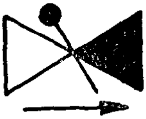
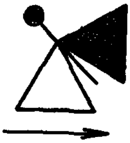
*For other types of operations, *see* **2.2**.

No.	Description	Symbol
2.5.4	Non-return valve, straight	 **
2.5.5	Non-return valve, angle	 **
2.5.6	Non-return valve, straight, screw down (hand operated)	 * **
2.5.7	Non-return valve, angle, screw down	 * **
2.5.8	Swing check valve, straight through	 **
2.5.9	Swing check valve, angle	 **

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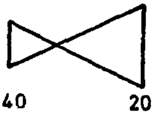
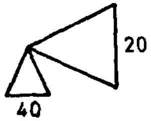
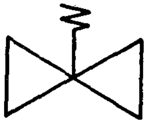
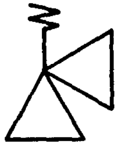
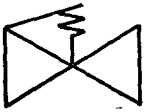
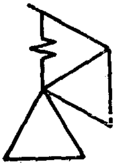
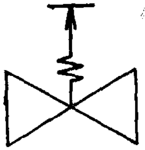
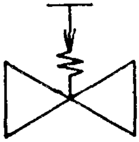
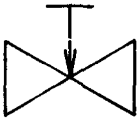
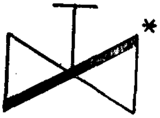
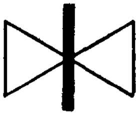
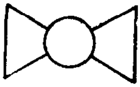
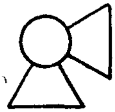
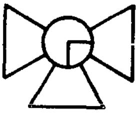
*For other types of operations, *see* 2.2.

**The arrow gives the direction of flow, but need not be drawn near the valve in drawings and/or schemes.

No.	DESCRIPTION	SYMBOL
2.5.10	Pressure reducing valve, straight (small triangle — high pressure)	
2.5.11	Pressure reducing valve, angle (small triangle-high pressure)	
2.5.12	Safety valve, straight	
2.5.13	Safety valve, angle	
2.5.14	Self-closing valve, straight	
2.5.15	Self-closing valve, angle	
2.5.16	Quick opening valve	

No.	DESCRIPTION	SYMBOL
2.5.17	Quick closing valve	
2.5.18	Regulating valve (hand operated)	
2.5.19	Butterfly valve (hand operated)	
2.5.20	Gate valve	
2.5.21	Cock, straight through	
2.5.22	Cock, angle	
2.5.23	Cock, three-way, L-port in plug	

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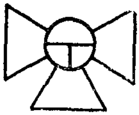
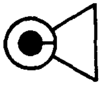
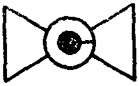
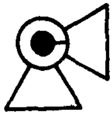
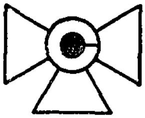
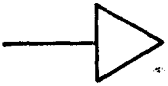
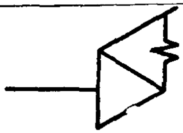
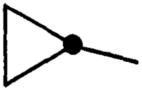
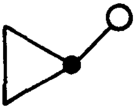
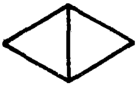
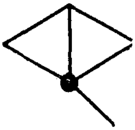
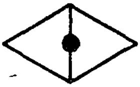
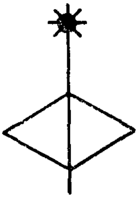
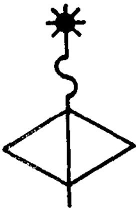
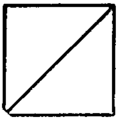
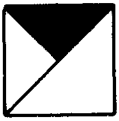
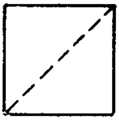
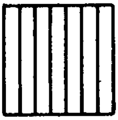
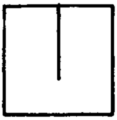
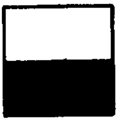
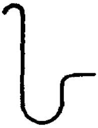
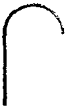
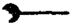
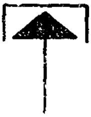
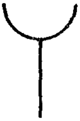
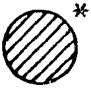
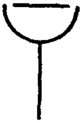
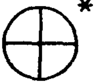
*For other types of operations *see* 2.2.

No.	Description	Symbol
2.5.24	Cock, three-way, T-port in plug	
2.5.25	Cock, with bottom connection	
2.5.26	Cock, straight through, with bottom connection	
2.5.27	Cock, angle, with bottom connection	
2.5.28	Cock, three-way, with bottom connection	
2.5.29	Tap (bib or pillar)	
2.5.30	Self-closing tap (bib or pillar)	
2.5.31	Swivel tap with delivery nozzle	

No.	Description	Symbol
2.5.32	Ball valve	
2.5.33	Mixing valve	
2.5.34	Swivel mixing valve with delivery nozzle	
2.5.35	Anti-scalding mixing valve	
2.5.36	Combined bath and shower fitting with shower arm and lower discharge nozzle	
2.5.37	Combined bath and shower fitting with flexible tube and handspray and lower discharge nozzle	

2.6 Appliances and Fittings (Piping System)

No.	Description	Symbol
2.6.1	Suction box	
2.6.2	Suction box with non-return valve or flap	
2.6.3	Mudbox	
2.6.4	Filter or strainer or grill	
2.6.5	Separator (gravity)	
2.6.6	Steam trap	

No.	Description	Symbol
2.6.7	Siphon	
2.6.8	Air pipe/swan neck ventilator	  *
2.6.9	Short sounding pipe with self-closing device	
2.6.10	Scupper	  *
2 6.11	Scupper with closing device	  *

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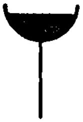
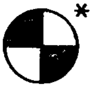
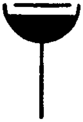
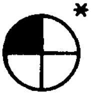
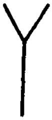
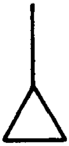
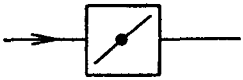
*The plan view may be used as an option.

No.	Description	Symbol
2.6.12	Scupper with water seal (open)	  *
2.6.13	Scupper with water seal and closing device	  *
2.6.14	Funnel (hopper)	
2.6.15	Bell-mouthed pipe end	

2.7 Appliances and Fittings (Ventilation System)

2.7.1	Butterfly damper	

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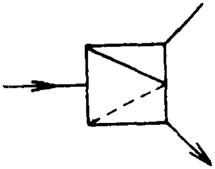
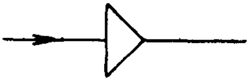
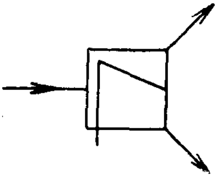
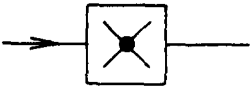
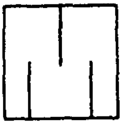
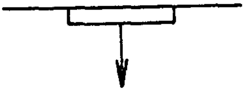
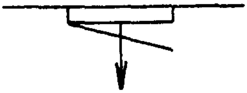
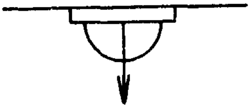
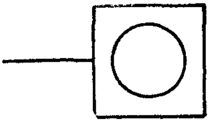
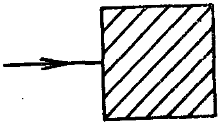
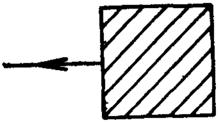
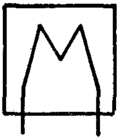
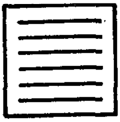
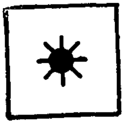
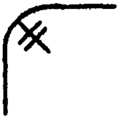
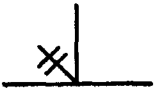
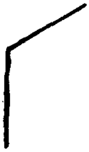
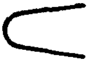
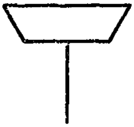
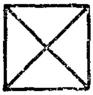
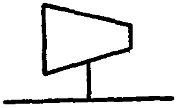
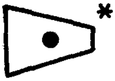
*The plan view may be used as an option.

No.	Description	Symbol
2.7.2	Change-over damper	
2.7.3	Reducing damper	
2.7.4	Distributing damper	
2.7.5	Fire damper	
2.7.6	Silencer	
2.7.7	Normal air outlet ↓	
	Normal air inlet ↑	
2.7.8	Normal air outlet with closing device ↓	
	Normal air inlet with closing device ↑	

No.	Description	Symbol
2.7.9	Punkah louvre outlet	
2.7.10	Diffuser outlet	
2.7.11	Air grill (supply)	
2.7.12	Air grill (exhaust)	
2.7.13	Air heater	
2.7.14	Air cooler	
2.7.15	Humidifier	

No.	Description	Symbol
2.7.16	Vanes	 

2.8 Ventilators

2.8.1	Turnable ventilator cowl outlet or exhaust ↑ inlet or supply ↓	  *
2.8.2	Fixed ventilator cowl	  *
2.8.3	Wall ventilator cowl	  *

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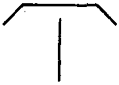
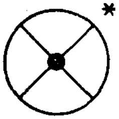
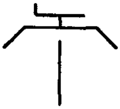
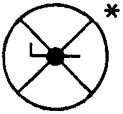
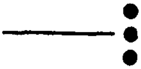
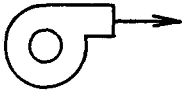
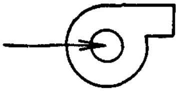
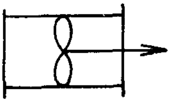
*The plan view may be used as an option.

No.	DESCRIPTION	SYMBOL
2.8.4	Mushroom ventilator NOTE — Where applicable with indication with screen	 
2.8.5	Mushroom ventilator with closing device NOTE — Where applicable with indication with screen	 
2.8.6	Flame arrestor	
2.8.7	Centrifugal supply fan	
2.8.8	Centrifugal exhaust fan	
2.8.9	Axial supply fan	

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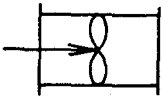
*The plan view may be used as an option.

No.	DESCRIPTION	SYMBOL
2.8.10	Axial exhaust fan	

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2